Class 26: *Monday, November 7*

Rate Equations, Slope Functions and Concavity

Reading: *Smith & Minton* Section 3.5.

The slope function $F(y)$ for a rate equation of the form $y' = F(y)$ can also be used to find other properties of the solution of the rate equation. The first derivative of the slope function, $F'(y)$, can be used to find *inflection values.* A value $\hat{y}$ is an inflection value for a solution $y(t)$ of the rate equation if $\hat{t}$ is an inflection point of $y(t)$ and $y(\hat{t}) = \hat{y}$. An inflection point of a function $y(t)$ is a point where the second derivative y'' changes sign and the graph of the function changes concavity. We will use this information to sketch more accurate solution curves of rate equations and initial value problems.

Homework 10: *Smith & Minton* Section 3.5: 10, 22, 24 (*You do not need to find the extrema.*), 51, 52.

Lab: *Monday, November 7 and Tuesday, November 8.*

Newton's Method

Class 27: *Wednesday, November 9*

Taylor's Method Revisited

Reading: *Hughes-Hallett*, p.510 and pp.530-533.

Just about everything we have seen in this course has been based on local, linear approximations. However, this kind of approximation doesn't utilize some important features of a function, such as its curvature. Having seen the First Degree Taylor Polynomial, we will now consider Second Degree Taylor Polynomials. This will allow us to have more information about our function in our approximations.

Homework 10: Handout given out in class.

Class 28: *Friday, November 11*

Newton's Method

Reading *Smith & Minton* Section 3.2

Optimization and graphing problems often involve finding *roots* of a function – points where the value of the function is *zero*. This class will extend your knowledge of Newton's Method for finding roots. It is based on the Microscope Approximation, and is one of the most powerful methods available.

Take Home Quiz handed out in class

Homework 11: *Smith & Minton* Section 3.2: 2, 16, 30, plus Handout from class.

Homework 10 Due in the Math 114 Course Box by 5 pm